



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,543	01/12/2004	Uwe Walz	KON-51C-CIP	1311

7590 09/26/2005

Douglas J. Hura, Esquire  
DENTSPLY International Inc.  
570 West College Avenue  
York, PA 17405-0872

EXAMINER

HU, HENRY S

ART UNIT PAPER NUMBER

1713

DATE MAILED: 09/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/755,543

Applicant(s)

WALZ ET AL.

Examiner

Henry S. Hu

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on IDS of 3-1-2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                                             |                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                 | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                        | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3-1-04</u> . | 6) <input type="checkbox"/> Other: _____                                                |

Art Unit: 1713

1. It is noted that **this application 10/755,543 filed on January 12, 2004 is a CIP of 10/413,753 filed on April 15, 2003 (now abandoned), which is a CON of 09/880,589 filed on 06/13/2001 (now abandoned).**

2. This Office Action is in response to the CIP of 10/413,753 (which is CON of 09/880,589). **Claim 1 was amended**, while no new claim or new matter was added. To be more specific, parent Claim 1 was only amended to correct all the informalities in claim objections (a) – (d) pointed out by the Examiner. With respect to the specification objections (a) - (g), the Applicants have amended all the paragraphs in specification with informalities pointed out by the Examiner. The examiner thereby withdraws specification objections and claim objections in the previous Office Action dated July 11, 2003 for 10/413,753. **Claim 1 is now pending.** In a close examination, the amendment of parent Claim 1 is only to correct the informalities or typographical error. Therefore, it still carries exactly the same scope of limitations as before. An action follows.

### **DETAILED ACTION**

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1713

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Szum (US 6,240,230) in view of Mukai et al. (US 4,983,644) and Stansbury et al. (US 6,184,339).

Regarding the limitation of the parent **Claim 1**, Szum discloses a radiation-curable composition comprising the following pre-mixture ingredients (column 3, line 4-16): **(A) 20-80 wt% of at least one urethane (meth)acrylate oligomer** comprising (i) at least one polyether oligomer backbone, (ii) **at least one aliphatic urethane linking group**, and (iii) **at least one end-capping radiation-curable group**, **(B) 20-80 wt% of at least one monomer to be useful as diluent**, **and (C) optionally, at least one photoinitiator**.

Art Unit: 1713

Szum further discloses that combination of different polyether backbone repeat units can be used (column 4, line 55-56) and the polyether polyols can be prepared by ring-opening polymerization by use of ethylene oxide or propylene oxide (column 5, line 5-15). The disclosure for monomer diluents mentioned at column 7, line 24-37 including ethoxylated bisphenol-A diacrylate and other mono-/poly- (meth)acrylates are set forth the claimed limitation of (vii) and (viii). The multifunctional isocyanates mentioned at column 5, line 57-67 are also set forth the claimed isocyanate limitation of (vi).

5. The difference between Szum and the instance Claim 1 is that **Szum does not specifically disclose the use of the bisphenol-A derived polyetherpolyol and polyesterpolyol to prepare the urethane oligomer as the claimed (vi).** Mukai et al. teach a dental adhesive composition including one isocyanate-group-containing urethane prepolymer which can be prepared from both polyetherpolyol and polyesterpolyol, wherein the polyol carries alkoxy repeat units (column 2, line 12-25) can be prepared from alkylene oxide with the diols by addition polymerization (column 2, line 18-22). Mukai et al. further teach the polyesterpolyol is a bisphenol-A derivated polyesteretherpolyol (column 5, line 1-4) which when  $q=1$ , the structure is equivalent to the claimed compound A. The advantage is the excellent bonding is obtained when such a chemical composition is used to bond a living dental tissue (abstract, line 1-3). Combining such a urethane oligomer with ethoxylated bisphenol-A diacrylate will have the advantage due to a better compatibility. **Stansbury et al.** teach the use of epoxide ring-opening prepared multifunctional monomers and urethane prepolymer with acrylic functional groups will obtain a dental material of low shrinkage at 3.4 % (abstract).

Therefore, one having ordinary skill in the art would have found it obvious to **prepare a urethane oligomer from bisphenol-A derived polyetherpolyol and polyesterpolyol as taught by Mukai et al. to be used in Szum's composition useful as a better dental bonding with expectation of an advantage of a low shrinkage as taught by Stansbury et al.**

6. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mukai et al. (US 4,983,644) in view of Stansbury et al. (US 6,184,339).

Regarding the limitation of the parent **Claim 1**, Mukai et al. disclose a dental adhesive composition useful in bonding a living dental tissue with metal, polymer or ceramic. The composition comprises: **(A) at least one isocyanate-group-containing urethane prepolymer, (B) at least one radical-polymerizable unsaturated monomer, and (C) at least one initiator** (abstract and column 1, line 63 – column 2, line 5).

Mukai et al. also disclose the isocyanate-group-containing urethane prepolymer can be prepared from the use of polyetherpolyol and polyesterpolyol, wherein the polyol carries alkoxy repeat units (column 2, line 12-25) can be prepared from alkylene oxide with the diols by addition polymerization (column 2, line 18-22).

Mukai et al. further teach the polyesterpolyol is a bisphenol-A derived polyesteretherpolyol (column 5, line 1-4) which when  $q=1$ , the structure is equivalent to the claimed compound A. The monomers disclosed at column 4, line 40-68 including

Art Unit: 1713

ethoxylated bisphenol-A diacrylate and other mono-/poly- (meth)acrylates are set forth the claimed limitation of (vii) and (viii). The multifunctional aliphatic isocyanates at column 5, line 60 – column 6, line 15 are also set forth the claimed urethane limitation of (vi).

7. The difference between Mukai et al. and the instance Claim 1 is that **Mukai et al. do not specifically disclose the use of the bisphenol-A derived polyetherpolyol to prepare the urethane oligomer as the claimed (vi).** Stansbury et al. teach by using bisphenol-A derivated and epoxide ring-opening prepared multifunctional monomers and urethane prepolymer with acrylic functional groups will obtain a dental material of low shrinkage at 3.4 % (abstract; column 3, line 5-17). It should be noted **the use of bisphenol-A derivated polyetherpolyol to combine with the bisphenol-A derived polyesterpolyol will have the advantage to be more compatible in the preparation of the urethane oligomer since both polyols are bisphenol-A derivatives.** Combining such a urethane oligomer with ethoxylated bisphenol-A diacrylate will thereby have the advantage due to a better compatibility.

Therefore, one having ordinary skill in the art would have found it obvious to **use the urethane oligomer prepared from bisphenol-A derived polyetherpolyol and polyesterpolyol as taught by Mukai et al. with advantage of compatibility in urethane oligomer preparation to be used in Mukai et al.'s composition useful as a dental coating with expectation of advantage as a low shrinkage (3.4 %) as taught by Stansbury et al., and/or even a lower shrinkage due to the better compatibility as discussed above.**

Art Unit: 1713

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to the preparation of polymerizable acrylic dental material using **Bisphenol-A derivatives** (see components (d) and (g):

US Patent No. **5,998,499 to Klee et al.** disclose the preparation of a low shrinkage dental composition by polymerization of a **liquid crystalline compound (abstract, line 1-8), which reads on the claimed alkoxylated bisphenol dimethacrylate** (columns 9, 11, 15 and 23). However, Klee fails to disclose using together a diol-functionalized di- or poly(meth)acrylate as claimed on page 15 in present invention as well as using the other components. Therefore, Klee fails to teach limitation of present invention.

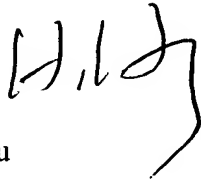
9. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Dr. Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.



Art Unit: 1713

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

September 15, 2005



DAVID W. WU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700